PHYSICS NMDCAT

TOPIC WISE TEST (UNIT–8)

TOPICS:

✓ **Electromagnetism**

Q.1 **The force on charge particle q moving with velocity v in magnetic field $\vec{B}$ is $\vec{F} = q\vec{v} \times \vec{B}$. The work done by magnetic force on the particle**

A. Depends upon $|\vec{v}|$ B. Depends upon $|\vec{B}|$

C. Angle between $\vec{v}$ and $\vec{B}$ D. Zero

Q.2 **If a particle of charge 10^{-12} C moving along the X-direction with a velocity 10^5 m/s experiences a force of 10^{-10} N in y-direction, then the minimum magnetic field is**

A. 6.25×10^3 T in the positive z-direction B. 10^{-15} T in the negative Z-direction

C. 10^{-3} T in the positive Z-direction D. 10^{-3} T in the negative Z-direction

Q.3 **A magnetic field exerts a force on a charged particle**

A. Always

B. Never

C. If it is moving across the magnetic lines of force

D. If it is moving along the magnetic lines of force

Q.4 **Magnetic effect of current was discovered by**

A. Faraday B. Ampere

C. Oersted D. Bohr

Q.5 **A current carrying wire produces**

A. Only electric field B. Only magnetic field

C. Both "A" and "B" D. No field

Q.6 **An electron and a proton travel with equal speed and in the same direction, at 90° to a uniform magnetic field. They experience forces, which are initially**

A. In opposite direction and differing by a factor of about 1840

B. Equal but in opposite direction

C. In the same direction and differing by a factor of 1840

D. Identical

Q.7 **When a charged particle moves perpendicular**

A. Speed of the particle is changed

B. Direction of the particle remains unchanged

C. Speed of the particle remains unchanged

D. Acceleration of the particle remains unchanged

Q.8 **The magnetic flux linked with a vector area $\vec{A}$ in a uniform magnetic field $\vec{B}$ is:**

A. $\vec{B} \times \vec{A}$ B. AB

C. $\vec{B}.\vec{A}$ D. B/A

Q.9 **When a positively charged particle enters in a uniform magnetic field with uniform velocity, its trajectory can be**

(i) a straight line

(ii) a circle

(iii) a helix

A. (i) only B. (i) or (iii)

C. (i) or (ii) D. any one of (i), (ii) and (iii)

Q.10 **Consider the statements:**

(i) If magnetic field $\vec{B} = 0$, then magnetic flux is also zero

(ii) If magnetic flux $\phi = 0$, then magnetic field is also zero

A. (i) is true, (ii) may be true B. (i) may be true, (ii) is true

C. Both (i) and (ii) are true D. Both (i) and (ii) are false

Q.11 An electric current is flowing in a long straight wire. The magnetic field due to this current at a distance of 5 cm from the wire is 10 gauss. The magnetic field at a distance of 10 cm from the wire is

A. 2.5 gauss
B. 5 gauss
C. 20 gauss
D. 40 gauss

Q.12 The unit of magnetic flux is equal to;

A. Weber
B. N/C
C. Tesla
D. Wb/A

Q.13 Magnetism is related to:

A. Stationary charge
B. Moving charge
C. Both 'A' and 'B'
D. None of these

Q.14 In case of a straight conductor, the magnetic lines of force are

A. Circular
B. Tangential
C. Only a straight-line
D. All of above

Q.15 One Wbm^{-2} is equal to

A. 10^4 gauss
B. 10^{-2} gauss
C. 10^2 gauss
D. 10^{-4} gauss

Q.16 The branch of physics which deals with the magnetic effect of electric current is known as

A. Magnetism
B. Electrical engineering
C. Electromagnetism
D. Electronics engineering

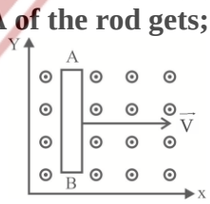
Q.17 The total number of magnetic lines of force passing through a certain area perpendicular to a magnetic field is called

A. Magnetic flux
B. Magnetic flux intensity
C. Magnetic flux density
D. Magnetic potential

Q.18 A charged particle moves with velocity $\vec{v}$ in a uniform magnetic field $\vec{B}$. The magnetic force experienced by the particle is

A. Always zero
B. Zero if $\vec{B}$ and $\vec{v}$ are perpendicular
C. Never zero
D. Zero if $\vec{B}$ and $\vec{v}$ are parallel

Q.19 A conductor rod AB moves parallel to x-axis in a uniform magnetic field, pointing in the positive x-direction. The end A of the rod gets;



A. Positively charged
B. Neutral
C. Negatively charged
D. First positively charged and then negatively charged

Q.20 A uniform electric field and a uniform magnetic field are produced, pointed in the same direction. An electron is projected with its velocity pointed in the same direction.

A. The electron will turns to its right
B. The electron will turns to its right
C. the electron velocity will increase in magnitude
D. The electron velocity will decrease in magnitude

Q.21 When a charge particle remains un deflected through a region of space then possibilities about the magnetic field in that region are

A. $\vec{B}=0$
B. $\vec{F}_E=-\vec{F}_B$
C. $\theta=0^o$ *or* $\theta=180°$
D. All

Q.22 A particle of mass M and charge Q moving with velocity $\vec{v}$ describe a circular path of radius R when subjected to a uniform transverse magnetic field of induction B. The work done by the field when the particle completes one full circle is

A. $\left(\frac{Mv^2}{R}\right)2\pi R$
B. $BQ2\pi R$
C. Zero
D. $BQv2\pi R$

Q.23 In case of a straight current carrying conductor, the magnetic field lines are

A. Circular
B. Tangential
C. Only a straight line
D. All of above

Q.24 The magnetic flux will be maximum if

A. Field is directed along normal to area.
B. Field is directed along parallel to area
C. The vector area is parallel to field.
D. Both "A" and "C"

Q.25 Which of the following is the unit of magnetic flux density?

A. weber
B. tesla
C. henry
D. Wb m^2

Q.26 The uniform magnetic field is

A. the field of a set of parallel conductors
B. the field in which all magnetic lines of force are parallel and equidistant
C. the field of a single conductor
D. none of the above

Q.27 A uniform magnetic field will cause a charge to move in a circle if the charge is moving

A. perpendicular to the field lines and the field strength is constant
B. parallel to the field and the field is constant
C. perpendicular to the field and the field is increasing
D. parallel to the field and the field is increasing

Q.28 The magnetic flux through a wire loop in a magnetic field does not depend on

A. The area of the loop
B. The magnitude of the field
C. The shape of the loop
D. The angle between the plane of the loop and the direction

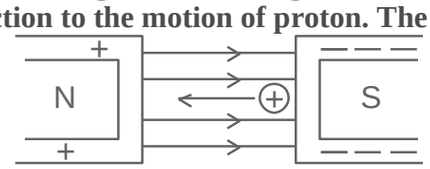
Q.29 Two long straight wires are set parallel to each other. Each carries a current i in the same direction and the separation between them is 2r. The strength of the magnetic field midway between them is

A. $\mu_o i/r$
B. $4\mu_o i/r$
C. Zero
D. $\mu_o i/4r$

Q.30 An electron and a proton enter a magnetic field perpendicularly. Both have same kinetic energy. Which of the following is true?

A. Trajectory of electron is less curved
B. Trajectory of proton is less curved
C. Both trajectories are equally curved
D. Both move on straight-line path

Q.31 A proton is projected in a region containing both electric and magnetic field pointing in opposite direction to the motion of proton. The proton may



A. Move in same direction with increasing speed
B. Deflect upward with same speed
C. Deflect downward with decreasing speed
D. Move in same direction with decreasing speed

Q.32 An electron moves at $2x10^2$m/sec perpendicular to magnetic field of 2T. What is the magnitude of magnetic force?

A. 1×10^{-6}N
B. 3.6×10^{-24}N
C. 6.4×10^{-17}N
D. 4×10^{6}N

Q.33 Four particles move at the same speed in the direction perpendicular to the same magnetic field which particle is deflected the most?

A. A copper ion
B. An electron
C. A helium
D. A proton

Q.34 A proton enters in a magnetic field of strength B(TeslA. with speed v, parallel to the direction of magnetic lines of force. The force on the proton is

A. evB
B. Zero
C. ∞
D. $\frac{evB}{2}$

Q.35 A charged particle moving in a magnetic field experiences a force given by:

A. F = qvBcosθ
B. F / sinθ = qvB
C. $F = \frac{qv}{B}\cos\theta$
D. $F = \frac{qv}{B}\sin\theta$

Q.36 One proton beam enters a magnetic field of 10^{-4}T normally, Specific charge = 10^{11}C/kg. velocity = 10^{7}m/s. What is the radius of the circle described by it

A. 0.1 m
B. 10 m
C. 1 m
D. none

Q.37 A proton and an alpha-particle enter a uniform magnetic field with the same velocity. The period of rotation of the alpha-particle will be

A. Four times that of the proton
B. Two times that of the proton
C. Three times that of the proton
D. Same as that of the protons

Q.38 A proton (or charged particle) moving with velocity v is acted upon by electric field E and magnetic field B. The proton will move undeflected if

A. E is perpendicular to B
B. E is parallel to v and perpendicular to B
C. E, B and v are mutually perpendicular and v=E/B
D. E and B both are parallel to v

Q.39 A charged particle travelling in a uniform field could have a circular trajectory if the field is

A. gravitational
B. magnetic
C. electrical
D. gravitational or electrical

Q.40 The magnetic flux through a wire loop in a magnetic field does not depend on

A. The area of the loop
B. The magnitude of the field
C. The shape of the loop
D. The angle between the plane of the loop and the direction

Q.41 A square coil $10^{-2}m^2$ area is placed perpendicular to a uniform magnetic field of strength $10^{3}Wb/m^2$. The magnetic flux through the coil

A. 10 weber
B. 10^{-5}weber
C. 10^{5} weber
D. 10^{0} weber

Q.42 An electron and a proton with equal momentum enter perpendicularly into a uniform magnetic field, then

A. The path of proton shall be more curved than that of electron
B. The path of proton shall be less curved than that of electron
C. Both are equally curved
D. Path of both will be straight line

Q.43 An electron beam passes straight through a region where magnetic and electric fields are perpendicular to each other. If magnetic field is 2×10^{-3} Wb m^{-2} and electric field is 3.4×10^{4} Vm^{-1} the velocity of electron is

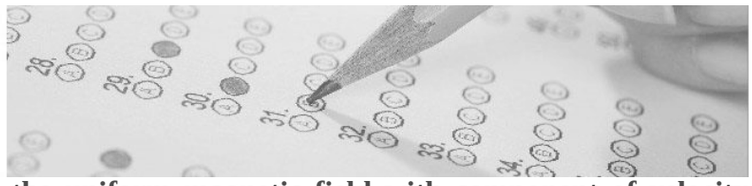
A. 6.8×10^{7} ms^{-1}
B. 3.4×10^{7} ms^{-1}
C. 1.7×10^{7} ms^{-1}
D. 6.8×10^{-7} ms^{-1}

Q.44 When a charged particle moves through a magnetic field, the effect of the field changes the particles

A. Speed
B. Energy
C. Mass
D. Direction

Q.45 The relation for e/m of an electron is

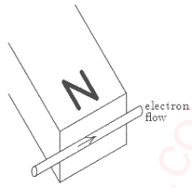
A. $\frac{2V^2}{BR}$
B. $\frac{2V}{Br^2}$
C. $\frac{2V}{B^2r}$
D. $\frac{2V}{B^2r^2}$



Q.46 An electron is injected in the uniform magnetic field with component of velocity parallel to and normal to field direction, then the path of electron is:

A. Helix
B. Circle
C. Parabola
D. bright line

Q.47 The figure shows the motion of electrons in a wire that is near the N pole of a magnet. The wire will be pushed



A. upwards
B. towards the magnet
C. downwards
D. away from the magnet

Q.48 The magnetic lines of force inside a bar magnet

A. are from north pole to south pole of the magnet
B. does not exist
C. depends upon the area of cross-pole of the magnet
D. are from south to north pole of the magnet

Q.49 The magnetic field at a distance r from a long wire carrying current i is 0.4 Tesla. The magnetic field at a distance 2r is

A. 0.2 Tesla
B. 0.8 Tesla
C. 0.1 Tesla
D. 1.6 Tesla

Q.50 A particle moving in a magnetic field increases its velocity, then its radius of the circle

A. Decreases
B. Remains the same
C. Increases
D. Becomes half

CTS-8 (PHY,CHEM)-KEY

1- D	11- A	21- B	31- C	41- B
2- D	12- C	22- A	32- C	42- C
3- A	13- C	23- A	33- C	43- C
4- D	14- C	24- C	34- A	44- C
5- A	15- B	25- D	35- C	45- D
6- C	16- C	26- B	36- A	46- A
7- D	17- D	27- B	37- A	47- C
8- A	18- D	28- A	38- A	48- A
9- A	19- B	29- B	39- D	49- B
10- D	20- B	30- D	40- D	50- A

1- D	11- B	21- D	31- D	41- A
2- D	12- A	22- C	32- C	42- C
3- C	13- B	23- A	33- B	43- C
4- C	14- A	24- D	34- B	44- D
5- B	15- A	25- B	35- B	45- D
6- B	16- C	26- B	36- C	46- A
7- C	17- A	27- A	37- B	47- A
8- C	18- D	28- C	38- C	48- D
9- D	19- C	29- C	39- B	49- A
10- A	20- D	30- B	40- C	50- C